## REMARKS

All claims in the parent application were rejected in an office action dated September 4, 2001, as obvious under principal reference Cheng in view of secondary references Jackson and Kusumoto.

It is basic patent doctrine going back to the CCPA that all limitations in a claim must be considered (See in re Saether, among others). It is respectfully proposed that the prior office action failed to follow that dictate, which has been repeated innumerable times by the CAFC.

To recap, the present invention is a golf club shaft having four layers in the following order:

1) first angled layer (inner layer with circular cross section)
2) first straight layer
3) second angled layer
4) second straight layer (outer layer with circular cross section)

All of layers 1)-4) have the following properties:

1) concentric with longitudinal axis
2) circular cross sections
3) extend over the entirety of length of the shaft

Finally, the second angled layer (third from center, second from outside) has at least one of an angle and a thickness effective to provide the shaft with:

1) torsional strength > 120 kgf×m×degrees and

2) shaft weight from 30 to 40 g

It is from the totality of the foregoing combination that the present invention derives its unique strength and lightness properties. None of the recitations may be ignored, since all are affirmatively recited limitations on the applicants' invention.

None of the references, either individually, or in any permissible combination, teaches or even suggests the unique combination of the present invention, as now recited in claim 1.

The Cheng reference reinforces the hosel section and a small region along the shaft from the hosel. This reference specifically recites (col. 4, lines 23-29) that the multilayer structure should not be used elsewhere because of "increasing the weight and stiffness of the shaft to an undesirable degree". Thus, the Cheng reference teaches away from the present invention, as recited in claim 1, in that it discloses reinforcing only part of the shaft at and near the hosel, but teaches the absence of the layered structure elsewhere. In addition, even where the Cheng reference discloses a layered structure, it is completely innocent of the structure of the present invention. The present invention recites layers from inside out as follows:

Angled
straight
angled
straight,

In its reinforced section, Cheng recites, from inside out:

Angled
angled
straight

That is, three layers instead of four, two angled layers together in sequence,

only one straight layer instead of two.

Besides getting the sequence of layers, and their location wrong, there is neither teaching nor suggestion in Cheng of a multilayer construction over the entire length of the shaft. disagree for cone

Cheng is completely innocent of the strength and weight limitations that one finds in the final clause of claim 1.

With so many deficiencies, it is respectfully proposed that Cheng, taken alone, is without disclosure which would be found persuasive in rejecting claim 1.

The secondary reference to Jackson is even further from forming a basis for rejection of claim 1 than is the Cheng reference. Jackson teaches a four-layer golf club shaft in which the four layers are laid up flat, and then spiral wound about a mandrel. Being spiral wound, the Jackson shaft fails to satisfy the recitations of claim 1 that all layers have circular cross sections (all Jackson layers have spiral cross sections). See circular cross sections in Fig. 1(b) of the present application. Thus the Jackson shaft is a completely different kind of product from the present invention. There cannot be a disclosure in Jackson about properties of the second angled layer (second layer from the outside) since, with the spiral structure, the third layer in the unwound layers of Jackson ends up as the second from the outside, but also the sixth and tenth (and possibly also the fourteenth) layer from the outside. Thus, to propose that the third layer in the unwound Jackson reference has thickness and angle properties that specifically affect strength and weight, as in claim 1, is a much greater stretch than is permissible in construing claims.

It is thus respectfully proposed that the present invention, as recited in claim 1, should be allowable over the Jackson reference taken by itself.

In addition, a proposed combination of Jackson with Cheng is still fatally deficient in disclosure which would render the present invention obvious. For openers, how would one combine the Jackson and Cheng references? The Jackson spiral-wound shaft extends along the entire length of the shaft, whereas, the Cheng reinforcement is limited to the vicinity of the hosel. If the Jackson spiral-wound structure were added to the Cheng shaft, it would violate the affirmatively recited prohibition of Cheng that the reinforced portion should be located only in the hosel

area in view of weight considerations.

Thus, adding the Jackson spiral-wound shaft to the Cheng club, would render non-functional the Cheng shaft. It is well accepted patent doctrine that a combination which renders the invention non-functional does not suggest anything that would render a claim obvious.

In view of the foregoing, it is respectfully proposed that the present invention, as recited in claim 1, should be allowable over any interpretation of the combination of Jackson with Cheng.

Turning now to the Kusimoto reference, this reference teaches a tubular body which may be used as a golf club shaft, fishing rod, and the like, which consists of six layers, plus three additional reinforcing layers at the ends. The six main layers are spiral wound with the following layer sequence:

1) cross wound (90 deg. To shaft axis)
2) diagonal
3) diagonal (opposite diagonal direction)
4) cross wound
5) lengthwise
6) lengthwise

There is nowhere in the Kusimoto structure that one can start and find the present **angled/straight/angled/straight** structure of the present invention. The present invention does not recite any cross-wound layers, not any two lengthwise layers one atop the other, nor any two oppositely angled diagonal layers next to each other. Thus the bare structure of the Kusimoto tubular body is so completely different from the present invention that one skilled in the art would not find teaching or even suggestion which would lead one even a single step toward the present invention. not used

The Kusimoto disclosure cannot meet the recitation in the final clause of claim 1 that the third layer has at least one of an angle and a thickness which satisfies a strength and weight bogey. What layer would one focus on in Kusimoto to select angle and thickness. It is respectfully proposed that one skilled in the art

would be at a loss to select the one of the six Kusimoto layers, and then to adjust angle and thickness to reach a specified strength and weight target.

Thus, it must be agreed that claim 1 should be allowable over the Kusimoto reference taken alone.

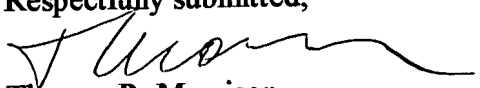
An attempted combination of Kusimoto with Cheng runs into the same problems as does the attempted combination of Jackson with Cheng, only more so. There is nothing in Kusimoto which can cure the fatal deficiency of Cheng. There is also nothing in Kusimoto which can stiffen the resolve of the Jackson reference in its combination with Cheng against claim 1. That is, how would one combine the Kusimoto six-layer, full-length shaft with the Cheng hosel-localized reinforcement. The same problem exists, and is no more answered than in the case of the Jackson reference.

It is hereby respectfully proposed that, when the examiner considers each and every one of the affirmatively recited recitations of claim 1, as he is obligated to do, he must find that claim 1 is allowable over the art of record. Early action toward allowance of claim 1 is hereby respectfully requested.

No new matter is added by the present amendment.

If additional fees or refund is found appropriate, the office is authorized to charge such fees or credit such overpayment to the Deposit Account No. 13-4550.

Respectfully submitted,



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Amended claim 1 marked up to show changes made.

1. (Amended) A light-weight golf club shaft comprising, sequentially:

said golf club shaft having a longitudinal axis;

an inner layer;

said inner layer being a first angled layer concentric with said longitudinal axis;

said first angular layer having a circular cross section;

a first straight layer formed on said first angled layer;

said first straight layer being concentric with said longitudinal axis and having a circular cross section;

a second angled layer formed on said first straight layer;

said second angled layer being concentric with said longitudinal axis and having a circular cross section;

a second straight layer formed on said second angled layer;

said second straight layer being an outer layer concentric with said longitudinal axis and having a circular cross section;

[said first angled layer, said first straight layer, said second angled layer, said second straight layer being arranged substantially concentrically about a central portion of said golf club shaft;]

said shaft having a length along a longitudinal direction;

each of said layers extend over an entirety of said length of said shaft; [and]

each of said layers includes fiber-reinforced composite material containing reinforcing fibers;

said reinforcing fibers of said second angled layer being oriented at an angle relative to said longitudinal direction of said shaft; and

said second angled layer having at least one of said angle and a thickness effective to provide said shaft with a torsional strength of at least 120 kgf×m×degrees and a weight of from 30 to 40 g.